



1 METHOD AND APPARATUS FOR CUSTOMIZING

2 FACIAL FOUNDATION PRODUCTS

3  
4 BACKGROUND OF THE INVENTION

5  
6 Field of the Invention

7 The invention concerns a method and apparatus for customizing a facial  
8 foundation product at the point of sale to a customer.

9  
10 The Related Art

11 Selection of the optimal color shade is often a customer's chief concern in  
12 purchasing a cosmetic facial product. A number of companies in the industry  
13 have sought to render easier the selection process. Clinique and Clarion have  
14 installed computers at sales counters for use by the customer. Information on  
15 color shade, oiliness and other properties of a customer's skin are punched into  
16 the computer which then determines the company's most closely matching  
17 product.

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19 Another point of sale technique has been that of custom blending. Two  
20 major companies, Prescriptives (division of Estee Lauder) and Visage (division of  
21 Revlon) begin a sale by manually evaluating a subject's skin color. The sales-

1 person then adjusts existing finished foundations so as to match the evaluated skin  
2 color. Unfortunately, there are many disadvantages in manual blending. The  
3 most obvious of these is that too much time is required for a match, sometimes  
4 30-45 minutes. On many occasions there is a poor skin match, reproducibility is  
5 poor and extensive training is required of the salesperson.

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7 Within the patent literature, U.S. 4,871,262 (Krauss et al) describes an auto-  
8 matic cosmetic dispensing system for blending selected additives into a cosmetic  
9 base. The system is intended for use at a retail establishment. A similar system is  
10 described in German Patent 41 10 299 C1 (Erdtmann), with the further element of  
11 a facial sensor. Although the aforementioned systems have advanced the art,  
12 additional refinements have become necessary to achieve commercial accept-  
13 ability in terms of speed and accuracy of product delivery.

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15 Accordingly it is an object of the present invention to provide a method  
16 and apparatus that will reduce time-required for matching skin properties with a  
17 particular optimum formula.

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19 Another object of the present invention is to provide a method and  
20 apparatus for matching skin properties with an optimal cosmetic formula in a  
21 manner that is both accurate and repeatable.

1           A further object of the present invention is to provide a method and  
2           apparatus for matching skin properties with an optimal cosmetic formula that  
3           requires only minimal training for the salesperson in selecting the proper product.  
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5           A still further object of the present invention is to provide a method and  
6           apparatus for matching skin properties with an optimal cosmetic formula and  
7           then rapidly and highly accurately dispensing the chosen cosmetic product.  
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9           These and other objects of the present invention will become more readily  
10          apparent through consideration of the following summary, drawing and detailed  
11          description which follow.

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1 and for generating a signal conveying information on the measured natural skin  
2 coloration;

3 (II) a programmable device for receiving the signal, for correlat-  
4 ing the signal with one of a preprogrammed set of formulas, and for selecting  
5 an optimal formula from the preprogrammed set; and

6 (III) a formulation machine for preparing the facial foundation  
7 product including:

8 (a) a mechanism for receiving the optimal formula as a set  
9 of operating instructions;

10 (b) a plurality of dispensers each containing a different  
11 cosmetic chemical composition including at least one  
12 pigment;

13 (c) a mechanism for activating dosing to a common dosing  
14 chamber of certain of the cosmetic chemical  
15 compositions and at certain concentrations as deter-  
16 mined by the operating instructions; and

17 (d) a mechanism for delivering the dosed formula into a  
18 container to the customer as a facial foundation  
19 product.

1        Besides natural skin coloration, a variety of skin characteristics may be  
2        measured including moisturization, oiliness, texture and irritation sensitivity. The  
3        measuring device may be a spectrophotometer. One or more light-emitting  
4        diodes may form the sensor portion of the spectrophotometer. Both visible and  
5        infrared wavelength light may be utilized in connection with the light-emitting  
6        diodes.

7  
8        Advantageously, at least some of the cosmetic chemical compositions  
9        will be monochromatic emulsions. Most preferred is that the formulation  
10       machine contain at least four dispensers separately containing a red, yellow,  
11       black and white monochromatic composition. Either in separate dispensers or  
12       as ingredients of the monochromatic emulsions there may be included  
13       emollients, sunscreens, moisturizers, perfumes, solvents and wrinkling and  
14       skin-aging inhibitors.

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16       An identification mark may be assigned to each customized facial  
17       foundation product. The marking may be labeled on the container as well as  
18       stored within the programmable device and permanently identified with the  
19       customer. Especially useful as the marking is a bar code.

1                                    **BRIEF DESCRIPTION OF THE DRAWING**  
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3                Features and advantages of the present invention will more fully be  
4                appreciated by reference to the **FIGURE** which is the sole drawing and which  
5                diagrammatically illustrates the customization system.  
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**DETAILED DESCRIPTION**

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3 In accordance with the invention, the system has three essential modules.  
4 These modules include an electronic skin analyzer, a computer with prepro-  
5 grammed formulas and a machine for dispensing-mixing of the cosmetic  
6 chemical compositions. These modules will be capable of electronically  
7 communicating with one another.  
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9 The skin analyzing module is preferably a hand-held spectrophotometer  
10 operating with at least one, but preferably four or more light-emitting diodes  
11 (LED). Suitable skin analyzers are commercially available from Minolta Camera  
12 Co. Ltd, Japan (Minolta Spectrophotometer CM-2002) and from Colortec  
13 Associates (diffused illumination/diffused viewing) Spectrophotometer.  
14

15 The second essential component of the apparatus is that of a program-  
16 mable device which may be a module separate from or housed commonly  
17 within the skin analyzing unit. The programmable device will include a prepro-  
18 grammed menu of at least 25, preferably several hundred, optimally several  
19 thousand facial foundation formulas directed at a particular facial foundation  
20 product.



1           A third essential module of the apparatus is that of a formulation  
2 machine. The machine will include a series of dispensers, each containing a  
3 different cosmetic chemical composition. Each of the dispensers will be con-  
4 nected into a common dosing chamber through respective tubing. An elec-  
5 tronic control board will also be part of the machine. This board will receive  
6 electronic instructions from the programmable device as to the optimal  
7 formula necessary to be dispensed. Servomechanical activators will be present  
8 within the machine to operate discharge valves for the respective dispensers.  
9 In accordance with the selected optimal formula, the requisite valves will be  
10 opened and the length of opening time will be regulated pursuant to the  
11 required quantity of any particular cosmetic chemical composition to be dis-  
12 pensed. Advantageously, the dosing chamber will be in the form of a dispos-  
13 able dispensing container provided directly to the customer and serving as the  
14 packaged bottle. The machine will also be capable of adjusting sample sizes  
15 of the dosed-mixed optimal formula.

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17           A marking mechanism may also be associated with the apparatus,  
18 preferably housed together with the formulation machine. The marking  
19 mechanism may utilize any numerical scheme, e.g. a customer's name, Social  
20 Security number, and/or other personalized identification, for connection with

1 the optimal cosmetic product selected through the skin measuring process.  
2 Advantageously, the marking will be in the form of a bar code symbol.

3  
4 Sometimes a customer may wish to alter the preprogrammed optimal  
5 formula. For such purpose, a further module is provided wherein a customer's  
6 preference can be entered to the program through a keyboard.

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8 A highly diagrammatic representation of the apparatus is provided in the  
9 **FIGURE**. Therein is shown a customer 1 whose facial skin is being measured by a  
10 skin analyzer 2. The resultant reading or signal is transferred electronically via  
11 line 4 into a programmable device 6. A preprogrammed set of formulas is  
12 reviewed for correlation with the skin reading. The optimal formula is then  
13 identified and that information is transferred via line 8 to a formulation machine  
14 10 where it is directed to a controller unit 12. Servomechanical devices 14 are  
15 operated in conjunction with the information on the optimal formula.

16  
17 When a particular facial foundation is required, an optimal color shade is  
18 delivered by combining a mixture of monochromatic compositions each of  
19 which is dosed from a respective dispenser. These dispensers contain a  
20 cosmetic chemical composition exhibiting one of four monochromatic colors,  
21 i.e. Red 16, Yellow 18, Black 20 and White 22. These colors will typically be

1 achieved by incorporation of a respective iron oxide pigment (e.g. red iron  
2 oxide, yellow iron oxide or black iron oxide). White can be obtained from  
3 titanium dioxide.  
4

5 The servomechanical device 14 operates a series of valves associated  
6 with each of the dispensers to deliver the proper amount of each monochro-  
7 matic colored composition. Delivery is through a system of tubing 24 which  
8 leads to a common dosing chamber 26. The dosing chamber is shown as an  
9 empty cosmetic bottle ready for sale to the customer. A moisturizing  
10 composition M' or modifying finish M'' may also be provided from separate  
11 dispensers 28, 30 into the dosing chamber 26. The customized facial foundation  
12 product 32 is then inspected by the customer. Any customer changes may be  
13 inputted to programmable device 6 for alteration of the preprogrammed  
14 optimum formula by instructions manually transmitted into the keyboard  
15 terminal 36. A second, final facial foundation product is then dispensed, mixed  
16 and bottled. Affixed to the bottle 32 will be a bar code printed through  
17 coder 34.  
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19 The method for customizing the cosmetic product is as follows. A region  
20 on a customer's face will be cleaned preparatory to a reading. The LED device  
21 will then be placed in proximity to the cleaned facial area. Visible light emitted

1 by the LED will be reflected off the skin surface and the altered wavelength  
2 measured. A total of three skin readings along the neck/jaw line region will be  
3 taken. Total time for the reading will be approximately 30 seconds.  
4

5 The collected wavelength information will then be transmitted to the  
6 programmable device. The program of the device will correlate the LED  
7 reading with a preprogrammed optimal formula. Information on this formula  
8 will then be transferred to the controller portion of a formulation machine. This  
9 information will then be translated into operating instructions to the dispensing  
10 unit. The selected cosmetic chemical compositions and their amounts will then  
11 be dosed to a dispensing container. The initial run will generate a trial sample  
12 of 5-10 ml which is given to the customer for review. Any necessary change in  
13 the formula, e.g. the color shade change, will then be manually programmed  
14 through a keyboard terminal into the programmable device. Again, instructions  
15 will be sent to the controller of the formulation machine and an adjusted  
16 sample will be dispensed-mixed and dosed in a full-size sample to an empty  
17 container bottle. A bar code containing shade and formula information is  
18 then affixed to the sample. Information on the purchased cosmetic formula will  
19 also be stored in a central computer. At any subsequent time, the customer  
20 can return to this or any other store having access to the system. Based on the  
21 bar code information, the exact same optimal formula can be prepared as a refill.

1           The method of this invention allows preparation of a relatively infinite  
2 number of different cosmetic formulations, e.g. color shades, to allow for  
3 enormous variations. These products are also freshly manufactured at the point  
4 of sale thereby avoiding any settling or decomposition during storage. Most  
5 significantly, there will be no necessity of maintaining in inventory a large  
6 number of different shades of color cosmetic, many of which will never be sold.  
7 Moreover, the method promises that a specific color shade or formulation  
8 would not be discontinued for lack of sales. Availability of the customized  
9 formula will also be at any location where the system is installed.

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12           The foregoing description illustrates selected embodiments of the present  
13 invention and in light thereof variations and modifications will be suggested to  
14 one skilled in the art, all of which are within the spirit and purview of this  
15 invention.